

OVERWINTERING AGGREGATIONS OF FEMALE *BRACHYMERIA INTERMEDIA* (HYMENOPTERA: CHALCIDIDAE).¹

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ABSTRACT: Discovery of 24 overwintering female *Brachymeria intermedia* in a single aggregation in a window sash in an unheated building; a single female in an attic window 7.4 m above ground; a cluster under felt (tar) paper in a dog house; and in naturally occurring dead stumps or trees—all suggest that any dry, well protected site is suitable for overwintering.

The introduced polyphagous pupal parasite *Brachymeria intermedia* has spread throughout much of the northeastern United States and Canada in close association with its principle host, the gypsy moth, *Lymantria dispar* (L.) (Lepidoptera: Lymantriidae). Two, possibly three, generations may occur during a season (Leonard 1981). Adult females of both generations overwinter while males die off before winter (Dowden 1935). Dowden (1935) speculated that overwintering adults "probably hibernate under the bark of dead trees or in similar places". Only decades later are we beginning to fully understand where overwintering occurs.

In Japan, Gytoku (1957) found overwintering *Brachymeria lasus* (Walker) (as *obscurata*) under the bark of a *Chamaechyparis obtusa* Endl. (Cupressaceae) tree with two aggregations totaling ca. 30 wasps on the lower 1.8 m of the south facing side of the trunk.

In laboratory experiments, Simser and Coppel (1980) showed the presence of a chemical that led both *B. lasus* and *B. intermedia* to choose previously used or conditioned overnight resting sites versus new or unconditioned sites. They speculated that this chemically mediated aggregating behavior might extend to overwintering individuals. Produced by adults of both sexes, this aggregation pheromone from *B. intermedia* was later identified as 3-hexanone (Mohamed and Coppel 1987).

Waldvogel and Brown (1978) first reported the discovery of overwintering *Brachymeria intermedia*. Groups of 5 to 15 females were found in tunnels made by wood borers in a dead *Quercus prinus* L. tree in central Pennsylvania. A similar discovery was made 6 January 1983 by Robert Grebeck (USDA, BIIR, Newark, DE) when ca. 15 females were found ca. 60 cm. off the ground in a dead *Pinus rigida* Mill. stump in Belleplain, Cape May Co., New Jersey (B. Grebeck, pers. comm.).

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Overwintering *B. intermedia* also use non-natural sites. I report here on a Dec. 30, 1981 discovery of a single aggregation of 24 female *B. intermedia* found in a window frame/casing in a residence in Wethersfield, Hartford Co., Connecticut. The window was located on an east wall of an unheated shed attached to a family residence. The aggregating females were clustered together in a vertical groove used to receive and hold a cotton sash cord in an old-fashioned counter-balanced window. The groove was in the side of a lower frame in a two-frame window. The cotton cord had worn out and parted, however the end fragment still filled the groove the entire 23 cm length. There was ample space between the cord and the 13 x 13 mm groove in the edge of the window frame so that wasps could move about freely. At the time of discovery, the lower window was raised almost daily but this did not appear to interfere with the overwintering *B. intermedia* as they tended to cluster together against the cotton cord, thereby avoiding being rubbed against the window casing as the sash moved. Wasps were observable only after removing the window jams and removing the sash from the frame. There was no indication of the approach route used to enter this site. The window fit the frame so loosely that it was possible the wasps entered the site simply by passing through the crack between the sash and frame.

In late December 1982, another overwintering female *B. intermedia* was found in a similar location in the same Wethersfield residence. One female was found simply between a loose fitting window sash and its frame. The window was a north facing unheated attic window at a height of 7.4 m above ground level and about 2 m above the roof of the above mentioned shed. This would suggest that overwintering sites are not limited to lower strata.

Others have observed *B. intermedia* overwintering in different artificial situations. Bill Metterhouse (NJ Department of Agriculture, Trenton), in the fall of 1982, found at least 25 female *B. intermedia* overwintering under felt (tar) paper covering a dog house at his residence in Monmouth Co., New Jersey. Furthermore, that spring he found over 50 live *B. intermedia* females on the inside of his cellar windows and many others dead on the basement floor (B. Metterhouse, pers. comm.).

All evidence reconfirms that only *B. intermedia* females overwinter. Overwintering, singly or in aggregations, appears to occur only in concealed, well protected, relatively dry sites, such as in dead trees that have been excavated by other insects, and in man-made objects.

If the pheromone-mediated aggregation behavior of *B. intermedia* females is involved in overwintering, as in over-night site selection, as Simser & Coppel (1980) have speculated, then an artificial aggregation site could be constructed, baited with aggregation pheromone, and

deployed as a survey tool to assess population levels or to measure overwintering survival.

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Another in the "Of the World" series, this is a popular guide to the classification and biology of bugs, by Oxford entomologist, Dr. McGavin.

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